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Author Affiliation:

¹Centre for Biotechnology, School of Pharmaceutical Sciences, Siksha 'O' Anusandhan (Deemed to be University), Kalinganagar, Bhubaneswar 751 003, Odisha, India

²Taxonomy & Conservation Division, Regional Plant Resource Centre, Nayapalli, Bhubaneswar, Odisha 751 015, India

Corresponding author:

Dr. Pratap Chandra Panda

Professor, Centre for Biotechnology, School of Pharmaceutical Sciences, Siksha 'O' Anusandhan (Deemed to be University)

Kalinga Nagar, Ghatikia, Bhubaneswar 751 003, Odisha, India

Email: pcpanada2001@yahoo.co.in; Mob: 94398 31495, 70083 78521

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New record of occurrence of *Sesamum alatum* Thonn. (Pedaliaceae) in Odisha with notes on the taxonomy and distribution of the genus *Sesamum* L. in the state

Pratap Chandra Panda¹✉, Prabhat Kumar Das², Pradeep Kumar Kamila¹

ABSTRACT

The wild occurrence of *Sesamum alatum* Thonn. (Pedaliaceae), a wild crop relative of the oil seed Sesame, is reported from Ganjam district as a new distributional record for the state of Odisha. Field studies and consultation of literature and herbarium specimens revealed the presence of three taxa of the genus *Sesamum* namely, *S. indicum* subsp. *indicum*, *S. indicum* subsp. *malabaricum* and *S. alatum* in Odisha against the reported occurrence of only one taxon in the state till date. Short botanical description, notes on ecology, phenology, distribution and colour photograph of *S. alatum* are provided in this paper along with up-to-date nomenclature of all the three included taxa.

Key words: *Sesamum alatum*, New Record, Crop Wild Relative, Odisha.

1. INTRODUCTION

After merger of the genera *Ceratotheca* Endl., *Josephinia* Vent. and *Dicerocaryum* Bojer (Pedaliaceae) with *Sesamum* L. on the basis of molecular systematic studies (Manning and Magee, 2018), the genus *Sesamum* L. is now comprised of 31 species (37 taxa), which are distributed mainly in Africa, South and Southeast Asia, Melanesia and Australia (Pradheep *et al.*, 2021; POWO, 2019; Mandal & Chhetri, 2019). All of them were traditionally classified under the tribe Sesameae (Endl.) Meisn. and possess axillary flowers, pink to purple obliquely campanulate corolla, anthers with oblong thecae, and false septa dividing the locules of the fruit (Ihlenfeldt, 1988).

In India, the genus *Sesamum* L. is represented by six species (7 taxa), namely, *S. indicum* L. (subsp. *indicum* and subsp. *malabaricum*), *S. mulayanum* N. C. Nair, *S. prostratum* Retz., *S. laciniatum* J. G. Klein ex Willd., *S. alatum* Thonn. and *S. radiatum* Schum. & Thonn. Of these, *S. alatum* Thonn. and *S. radiatum* Schum. & Thonn are known to be exotics naturalized in different

states of India. In the meantime, *S. mulayanum* N. C. Nair (Nayar, 1963) has been reduced to a synonym of *S. indicum* L. subsp. *malabaricum* (Burm.) Bedigian (Bedigian, 2014).

Haines (1922) and Saxena & Brahmam (1995) reported the occurrence of only one species namely, *Sesamum indicum* L. (*S. orientale* L.) from the state of Odisha, which is widely cultivated for its edible and oil yielding seeds but often escape cultivation and run wild in waste places. Bedigian (2015) in connection with a study of the taxonomy and phylogeny of *Sesamum* L. and its wild relatives cited a specimen of *S. indicum* L. subsp. *malabaricum* (Burm.) Bedigian collected by H. F. Mooney from Odisha (*Sambalpur district., Chamunda, H.F. Mooney 2309*) available at Kew herbarium (K). Pradheep *et al.* (2021) mentioned about the distribution of *S. mulayanum* N. C. Nair in Odisha but maintained that *S. indicum* subsp. *malabaricum* and *S. mulayanum* N. C. Nair are two distinct species distinguished by clear morphological characters in spite of the merger of *S. mulayanum* with *S. indicum* subsp. *malabaricum* by Bedigian (2014).

During plant biodiversity inventories of Odisha, the authors collected an interesting species of *Sesamum* from the sandy sea beach near Purunabandha (turtle nesting point) close to confluence point of river Rushikulya in Ganjam district of Odisha. After critical morphological study, it could be identified as *Sesamum alatum* Thonn. (Pedaliaceae). The species is considered to be a weed in sandy waste places in India and so far, known from Western Ghats of India, Andhra Pradesh and Puducherry only. The present occurrence of the species in Odisha extends the range of distribution of the species to further east of the country and forms a new distributional record for the state of Odisha. Besides, being a wild relative of cultivated oil seed Sesame (*S. indicum* L.), it has tremendous potential for crop improvement programme. The correct name, synonyms, botanical description, ecology, phenology and citation of specimens of *Sesamum alatum* Thonn. is provided here along with colour field photograph. The herbarium specimens have been deposited in the Herbarium of Regional Plant Resource Centre (RPRC), Bhubaneswar.

With this, the genus *Sesamum* L. is now represented by 3 taxa under 2 species namely, *S. indicum* subsp. *indicum* L., *S. indicum* subsp. *malabaricum* (Burm.) Bedigian and *S. alatum* Thonn.

2. TAXONOMIC TREATMENT

Sesamum alatum Thonn. *Beskr. Guin. Pl.* 284. 1827. *Sesamum sabulosum* A. Chev. *Etudes Fl. Afr. Centr. Franc.* i. 229. 1913, *nomen.* *Sesamum ekambaramii* Naidu, J. Bombay Nat. Hist. Soc. 51: 698. 1953. *Sesamum pterospermum* R. Br. *Voy. Abyss. [Salt] Append.* p. lxiv. 1814. *Volkameria alata* Kuntze, *Revis. Gen. Pl.* 2: 482. 1891. (Figure -1 A)

Erect annual herbs, reaching up to 1m. Stems quadrangular, purplish green, puberulous. Leaves heteromorphic; lower leaves with long petioles, digitately 3–5 partite, segments linear-lanceolate, margin undulate, middle segment prominent, glaucous and glandular beneath, glabrous above; upper leaves short-petiolate, simple, linear, 5–9 cm long. Nectary glands 2, borne on leaf axil, sessile, dark purple in colour. Flowers carmine or maroon in colour, pedicels short. Calyx segments lanceolate to narrowly triangular, 2–4 mm long, acuminate. Corolla obliquely campanulate, pubescent outside, curved and constricted near the base, 1.5–3 cm long, with dark-purple striations in the throat. Anthers dark purple. Styles purple. Stigmas bifid, purple. Capsules 3.0–4.5 cm long, cylindric, grooved, finely pubescent, gradually narrowed towards base, abruptly acuminate at the apex with a pointed beak; beak straight. Seeds light to dark brown, obovate, rough, winged at both the ends; wings suborbicular, membranous.

Flowering: October–November

Fruiting: November– December

Distribution: Widespread in Tropical Africa to Namibia and South Africa, Madagascar. Introduced weed in states of Tamil Nadu, Karnataka, Kerala, Puducherry, Andhra Pradesh and Odisha (present report) in India.

Ecology: It grows in sandy soils, wastelands, roadsides, beach sides, grasslands and as field weed under xeric habitats, especially during post-monsoon period.

Specimen examined: India: Odisha: Ganjam district, Purunabandha, Rushikulya river mouth, (N 19° 22' 32.03", E 85°02'28.71"), 10.11.2019, P. C. Panda and P. K. Das, 11408 (RPRC).

The updated nomenclature of the two subspecies of *Sesamum indicum* L. is provided below:

Sesamum indicum L. subsp. *indicum* Sp. Pl. 2: 634. 1753, *nom. cons.* *Sesamum orientale* L. Sp. Pl. 2: 634.

Sesamum indicum L. subsp. *malabaricum* (Burm.) Bedigian, Novon 23(1): 6. 2014. *Sesamum malabaricum* Burm., Fl. Malabar. Ind.: 4. 1769. *Sesamum orientale* L. var. *malabaricum* G. V. Narayana, Madras Agric. Journ. 37: 47–50. 1950. *Sesamum mulayanum* N. C. Nair, Bull. Bot. Surv. Ind. 5: 251. 1963. (Figure- 1 B)

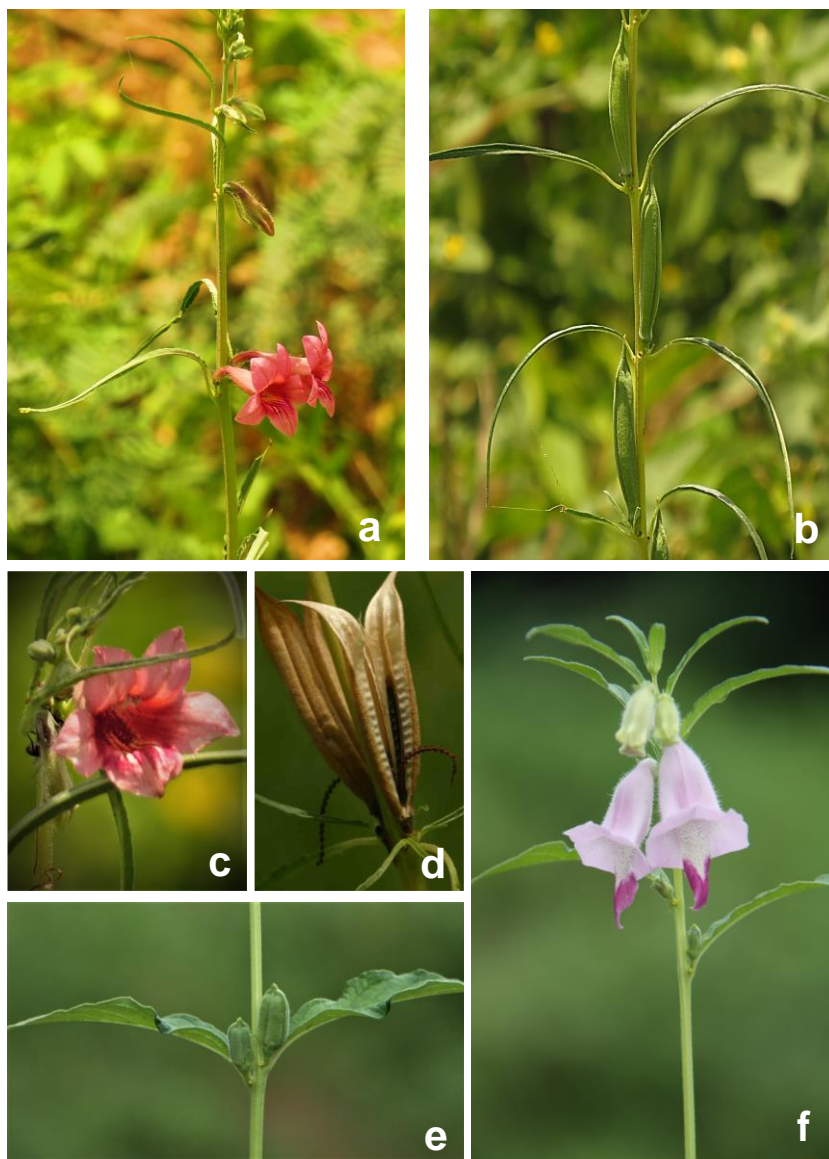


Fig.1: A. *Sesamum alatum* (a) Plant with flowers (b) Fruits (c) Close-up of flower (d) Fruit split open; **B. *Sesamum indicum* subsp. *malabaricum*** (e) Fruits and (f) Plant with flower

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Authors' contribution:

All authors have contributed equally to manuscript.

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Ethical approval

Sesamum alatum Thonn. (Pedaliaceae) plant was collected, identified and used in the study. The ethical guidelines for plants & plant materials are followed in the study. The herbarium specimens have been deposited in the Herbarium of Regional Plant Resource Centre (RPRC), Bhubaneswar, India.

Conflicts of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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